

## Koch, Kristine

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**From:** Koch, Kristine  
**Sent:** Monday, December 14, 2015 9:43 AM  
**To:** 'Jen Woronets'  
**Cc:** Jim McKenna (jim.mckenna@verdantllc.com); Carl Stivers; Loren Dunn (ldunn@riddellwilliams.com); Patty Dost; Amanda Shellenberger; Bob Wyatt; Cora, Lori; Allen, Elizabeth  
**Subject:** RE: Additional Explanation of FS Information Requests

Thanks Jen. I realized that I misspoke at the meeting with Carl. I thought that we had used what the LWG did, but I found out from my contractor that we did something different. I'll make sure that it is clearly explained in the revised FS.

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**From:** Jen Woronets [mailto:jworonets@anchorqea.com]  
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**To:** Koch, Kristine <Koch.Kristine@epa.gov>  
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**Subject:** FW: Additional Explanation of FS Information Requests

Kristine,

Please see below from Carl Stivers.

Let us know if you have any questions.

Thank you,  
Jen Woronets ©  
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**From:** Carl Stivers

**Sent:** Friday, December 04, 2015 10:38 AM

**To:** Jen Woronets <[jworonets@anchoragea.com](mailto:jworonets@anchoragea.com)>

**Cc:** [ldunn@riddellwilliams.com](mailto:ldunn@riddellwilliams.com); Patty Dost <[pdost@pearllegalgroup.com](mailto:pdost@pearllegalgroup.com)>; Amanda Shellenberger <[ashellenberger@anchoragea.com](mailto:ashellenberger@anchoragea.com)>; James McKenna <[jim.mckenna@verdantllc.com](mailto:jim.mckenna@verdantllc.com)>; Bob Wyatt <[rjw@nwnatural.com](mailto:rjw@nwnatural.com)>

**Subject:** RE: Additional Explanation of FS Information Requests

Kristine – Per our conference call on November 24, I agreed to send additional explanation of three of our FS information requests, which were Items 6, 7, and 40 from our September 8, 2015 requests. We have had further information exchanges on Item 6, which are acknowledged, but I thought it would be good to provide the explanation anyway, to avoid future confusion.

- Item 6 – The LWG requested the actual erosion areas identified by EPA based on shear stress. To elaborate, EPA's draft FS Figure 3.3-18 shows the 2 year shear stress across the site, by model cell. EPA's Section 3.3.2.2.1 text states (with my highlights added):

"Bedded sediments are prone to erosion and transport when shear stress on the sediment bed generated by water flow exceeds the critical shear stress of the sediment bed. In this analysis, the shear stress values during a 2-year flow event were determined from the Sedflume system results and the HST model (refer to the remedial investigation report Section 3 for further details); these values were then compared to the critical shear stress values of the bedded sediment. Areas where the shear stress of the 2-year event exceeds the critical shear stress of the bedded sediment are considered erosive. Note that the sediment bed area impacted by a 2-year event is smaller than the area impacted by a 100-year event because the spatial area of the sediment bed considered erosive is positively correlated with the return interval. The 2-year return interval was considered reasonable because it delineates areas that are routinely impacted by a flow event rather than areas that rarely experience flows that exceed the shear stress of the bedded sediment. Estimates of shear stress throughout the Site are shown on Figure 3.3-18."

Per the highlighted text, the LWG is seeking the areas that EPA determined "where the shear stress of the 2 year event exceeds the critical shear stress of the bedded sediment." Figure 3.3-18 only shows the "shear stress" for the 2 year event (as indicated by EPA's text, not the areas where the shear stress exceeded the bedded sediment critical shear stress, which would be the actual indication of where erosion might occur).

- Item 7 – The LWG requested an explanation of EPA's rationale for using a ratio of 0.5 for surface to subsurface sediment chemical concentrations for EPA's evaluation of natural recovery. EPA indicated that the ratio of 0.5 was the same as the LWG used in the 2012 draft FS, which appears incorrect. Per the LWG's October 9, 2015 Section 3 and 4 comments: "For example, EPA uses a surface to subsurface ratio of 0.5 (which is more conservative) to indicate likely MNR, whereas the 2012 draft FS uses a ratio of 0.67. EPA does not discuss the rationale for the selection of this more conservative ratio, or why it leads to any more valid conclusions about natural recovery at the Site." Table 6.2-4 of the 2012 draft FS summarizes the LWG's methods for assigning natural recovery categories to areas of the Site. The Category 3 column notes that this line of evidence was indicative of recovery when the subsurface to surface ratio exceeded 1.5 (i.e., when the subsurface concentration was more than 1.5 times higher than the surface concentration). Inverting this 2012 draft FS ratio of 1.5 to a ratio that is surface over subsurface (which is the form that EPA uses to evaluate this line of evidence) results in a ratio of 0.67, not 0.5. Essentially, EPA's ratio of 0.5 requires that subsurface concentrations are 2 times higher than the surface concentrations before EPA deems the core indicative of natural recovery, while the LWG's ratio of 0.67 requires that the subsurface concentrations are 1.5 times higher than the surface concentrations before the LWG deems the core indicative of natural recovery. The LWG is requesting an explanation of why EPA used the more conservative (i.e., less likely to predict natural recovery) ratio in the EPA FS evaluation of natural recovery.

- Item 40 – The LWG requested that EPA explain why some of the Section 4 dioxin/furan PRGs differ from the Section 2 dioxin/furan PRGs. EPA indicated it would be helpful for the LWG to identify which PRGs appeared to be different. Per the LWG’s October 9, 2015 Section 3 and 4 comments:

“19.p. Section 4 introduces PRGs for dioxin/furan congeners that were not included in Section 2. The following PRGs are included in EPA’s Table 4.2-1:

- i. HxCDF: Section 2 does not include a PRG for RAO 1 for this congener and three other congeners listed below. Section 2 presents only a 2,3,7,8-TCDD TEQ PRG for RAO 1. The HxCDF PRG in Table 4.2-1 happens to be equal to the TCDD PRG of 0.001 µg/kg divided by the TEF but that does not appear to be the case for all congeners (e.g., PeCDF).
- ii. EPA’s August 18, 2015 Table 4.2-1 and related figures also present a PRG for RAO 2 for this congener of 0.001 µg/kg (denoted “background ND”). EPA’s July 29, 2015 Section 2 presented an HxCDF PRG for RAO 2 of 0.000002 µg/kg. No background value was summarized in Section 2 for HxCDF, and therefore, it is unclear where this PRG came from.
- iii. PeCDD, PeCDF, TCDF - Section 2 does not include a PRG for RAO 1 for these congeners. Section 2 presents only a 2,3,7,8-TCDD TEQ PRG for RAO 1. Evaluating the remedy effectiveness for alternatives using these PRGs is therefore inconsistent with Section 2.
- iv. HxCDF RAO 6 PRG is inaccurately presented as being based on otter exposures in Table 4.2-1. Per EPA Section 2, the PRG of 0.003 µg/kg is based on Osprey (egg) per EPA Section 2.”

Please let me know if you would like to discuss further any of these explanations.

Thanks.

Carl

**Carl Stivers**

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